PROCEDURE

Meningocele repair

Meningocele repair is surgery to close a fluid-filled sac and the opening beneath it.

PURPOSE
Close the defect and protect surrounding tissue

PROCEDURE TYPE
Therapeutic surgery with open closure

WHERE IT IS DONE
Operating theatre

ANAESTHESIA
General anaesthesia

HOW LONG IT TAKES
Usually two to four hours

PREPARATION
Fasting, medication review, blood tests, and imaging

RECOVERY
Several hospital days; no driving until surgeon clearance

MAIN RISKS
Infection, fluid leakage, nerve injury, wound problems

RESULTS
Closure confirmed immediately; nerve function assessed over time

Overview

Meningocele repair is an operation to close a meningocele. A meningocele is a sac containing the protective coverings of the brain or spinal cord, called the meninges, and cerebrospinal fluid, the clear fluid surrounding the nervous system. Unlike a myelomeningocele, a simple meningocele usually does not contain spinal cord tissue or nerves.

Most meningoceles are present at birth and occur along the spine. Less often, they develop through an opening in the skull or appear later because of surgery, injury, or another condition.

During repair, the surgeon returns or removes the sac's lining as appropriate, closes the fluid-containing layer, and repairs the tissues over it. The exact operation is shaped by the meningocele's location, size, skin covering, and relationship to nearby nerves.

Why the procedure is performed

The main goal is to create a watertight covering over the brain or spinal cord. This helps protect delicate tissue and prevent cerebrospinal fluid from leaking.

Repair may also be recommended to:

An open or leaking meningocele in a newborn usually needs prompt specialist care. A small, fully skin-covered meningocele may allow more time for imaging and discussion before treatment.

Surgery closes the physical defect. It may not reverse nerve, bladder, bowel, or movement problems that were already present.

- Reduce the risk of infection when the sac is open or poorly covered
- Treat an existing fluid leak or repeated wound breakdown
- Protect an enlarging sac from injury
- Relieve pressure on nearby nerves or other structures
- Address tethering, in which the spinal cord is held too tightly by surrounding tissue
- Improve the chance of durable skin closure

Who should and should not have it

Repair is generally considered when the meningocele is open, leaking, enlarging, difficult to protect, or causing pressure on nearby structures. It may also be appropriate when imaging shows a connection that creates a meaningful risk of future leakage, infection, or nerve damage.

Not every skin-covered meningocele needs immediate surgery. Observation may be reasonable when the sac is small, stable, fully covered, and not affecting nerves or nearby organs. Regular examinations and sometimes repeat imaging are then needed.

Surgery may be delayed if you or your child is not stable enough for general anaesthesia. Serious breathing or circulation problems may need treatment first. An infection elsewhere in the body, poor skin condition around the planned incision, or a bleeding problem may also affect timing.

The team may advise against repair if the expected benefit is small compared with the surgical risk. Complex defects involving important nerves, blood vessels, or several medical conditions require an individual discussion with neurosurgery and other specialists.

How to prepare

The treating facility's own instructions take priority because fasting, medicines, and admission plans differ by age and type of repair.

Before surgery, the team may use MRI or CT imaging to map the sac and its connection to the spinal canal or skull. A neurological examination checks movement, sensation, reflexes, and bladder or bowel function where age allows. Blood tests may be needed before anaesthesia.

Tell the surgical and anaesthesia teams about:

Do not stop a blood thinner like warfarin or apixaban unless the treating team tells you when and how to do so.

You or your child will need to stop eating and drinking before general anaesthesia. Follow the facility's exact fasting times. If the meningocele is open or fragile, staff may give special instructions for positioning and protecting it.

- All medicines, vitamins, and supplements being taken
- Blood thinners or medicines that affect clotting
- Allergies and previous reactions to anaesthesia
- Recent fever, cough, infection, or skin changes
- Any new leakage, bleeding, or damage to the sac

What happens during the procedure

General anaesthesia keeps you or your child unconscious and free of pain. The anaesthesia team continuously monitors breathing, heart rate, blood pressure, and oxygen levels.

Positioning depends on the defect's location. Many spinal repairs are performed while lying face down. Pressure points are carefully padded.

The surgeon makes an incision around or near the sac. The tissues are examined to confirm whether nerves or spinal cord tissue are involved. The surgeon separates the meningeal sac from the skin and nearby structures while protecting nerves.

The fluid-containing covering, called the dura, is closed with stitches to make a watertight seal. The muscle, supporting tissue, and skin are then closed in layers. A plastic surgeon may help if there is not enough healthy skin for a safe closure.

The operation often takes a few hours. A large defect, difficult location, previous surgery, or need for complex skin reconstruction can make it longer.

Recovery and what to expect afterward

Pain or soreness around the incision is expected. Pain medicine is given regularly at first and reduced as comfort improves. Tell the team if pain is increasing rather than settling.

Fluids and food usually restart after you or your child is awake and the team considers swallowing safe. Some people feel sick after anaesthesia and need to begin slowly.

Activity is restricted to protect the repair. Positioning instructions are especially important after spinal surgery. The team will explain when sitting, lifting, bathing, tummy time, school, or exercise can restart. Do not place pressure on the incision unless staff say it is safe.

Adults and older teenagers must not drive home after general anaesthesia. Driving should wait until the surgeon has cleared it and pain, movement, and medicines no longer interfere with safe control of a vehicle.

Return to work or school is based on wound healing, comfort, the type of activity involved, and whether neurological care is still needed. Desk-based activity may resume sooner than lifting or physical work.

A hospital stay of several days is common, although complex repairs may require longer monitoring.

Risks and possible complications

The surgical team will explain risks that apply to the meningocele's location and your or your child's health. Possible complications include:

Further surgery may be needed if the closure leaks, the wound does not heal, or tethering develops. The risk of nerve injury is influenced by whether nerve tissue is attached to or unexpectedly enters the sac.

- Infection of the wound or deeper tissues
- Cerebrospinal fluid leaking through or collecting under the wound
- Bleeding or poor wound healing
- Injury to nearby nerves, spinal cord, or brain tissue
- New weakness, numbness, or bladder or bowel problems
- Reaction to anaesthesia
- The wound reopening

- Tethering or scarring around the spinal cord later
- Recurrence of the meningocele

Results and follow up

The surgeon can usually tell immediately whether the sac and opening were closed as planned. There is usually no tissue result to wait for unless a sample is sent to a laboratory for an unusual finding.

Nerve-related results take longer to assess. Movement, sensation, bladder function, and bowel function may be checked repeatedly during recovery. Surgery prevents some future problems but may not improve an existing neurological difficulty.

Routine follow-up includes a wound check and a neurological examination. Stitches may dissolve or may need removal, depending on the material used. Imaging is not required after every repair, but MRI or another scan may be arranged if there is concern about fluid leakage, tethering, recurrence, or associated abnormalities.

Children may need longer-term follow-up as they grow. This can involve neurosurgery, rehabilitation, orthopaedics, and bladder or bowel specialists.

Alternatives

Observation is the main alternative for a small, fully skin-covered meningocele that is stable and not affecting nearby structures. It avoids immediate surgery and anaesthesia, but the sac remains in place. Follow-up examinations and sometimes imaging are needed to detect growth, leakage, or nerve effects.

Protective dressings and careful positioning may be used temporarily when an open defect cannot be repaired immediately. These measures protect the area while other medical problems are stabilised, but they do not close the opening.

Treatment aimed only at pain, bladder problems, or mobility can improve daily function, but it does not repair the meningocele or stop a cerebrospinal fluid leak.

Fetal surgery is used only in selected pregnancies involving open myelomeningocele, a different and more complex defect containing neural tissue. It is not a routine alternative for a simple meningocele and carries risks for both the pregnant person and fetus.

When to call your healthcare team

Contact the surgical team promptly for increasing pain, redness, swelling, warmth, or drainage from the incision. Also call for a new soft swelling near the repair, clear watery leakage, repeated vomiting, trouble passing urine, or new changes in movement, sensation, bladder control, or bowel control.

Fever after surgery should be reported. Any fever in a young infant needs prompt medical advice.

Seek urgent assessment if the wound opens, fluid is continuously leaking, or the sac is injured before surgery.

Call emergency services for severe breathing difficulty, inability to wake the person normally, a seizure lasting longer than instructed in an existing seizure plan, or sudden severe weakness.

Routine questions about bathing, activity, school, work, or a planned wound review can usually wait for normal clinic hours.

Common questions

Will I or my child be asleep?

Yes. Meningocele repair is normally performed under general anaesthesia, so the person having surgery is unconscious and does not feel the operation.

Can I drive home afterward?

No. An adult having general anaesthesia needs someone else to provide transport. Babies and children also need an adult caregiver for the journey and recovery at home.

How painful is meningocele repair?

The incision is usually sore, especially during the first few days. The hospital provides pain relief and adjusts it according to comfort. Increasing pain after initial improvement should be reported.

When will I know whether it worked?

The surgeon can usually confirm the physical closure after the operation. Wound healing is assessed over the following days and weeks. Any change in nerve, bladder, or bowel function may take longer to evaluate.

Will the operation cure existing nerve problems?

Not always. Repair protects the area and closes the defect, but established nerve damage may remain. The surgeon can explain which improvements are realistic based on examination and

imaging.

Could another operation be needed later?

Sometimes. Further treatment may be needed for a fluid leak, wound problem, recurrent sac, or tethering of the spinal cord.

Sources

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